

**SEVENTH ANNUAL REPORT
OF THE
EMPLOYEE CONCERNS SPECIAL PROGRAM
CORRECTIVE ACTION IMPLEMENTATION**

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**TENNESSEE VALLEY AUTHORITY
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EXECUTIVE SUMMARY

This report is the Seventh Annual Report of the Employee Concerns Special Program (ECSP). The ECSP investigations resulted in the development of 1,591 Corrective Action Tracking Documents (CATDs). Of these, 1,178 were closed through December 31, 1994.

Between January 1, 1994 and December 31, 1994, the ECSP closed a net of 25 CATDs. During this period, there were 254 Corrective Action Plans (CAPs) that required a deviation from the originally approved corrective actions. Of these, 52 were Level IIa, 37 were Level IIb, and 165 were Level III CAP deviations during this reporting period.

Based on the CAP implementation, verification, overview and closure activities conducted through December 31, 1994, the completion of the CATDs is continuing to ensure correction of the problems identified by the ECSP. The Tennessee Valley Authority (TVA) intends to continue implementing, verifying, and closing CAPs or CATDs resulting from the ECSP evaluations to fulfill its commitment to employees and the Nuclear Regulatory Commission (NRC), and to realize the maximum benefit from the program.

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1.0 INTRODUCTION

Between January 1, 1994 and December 31, 1994, the ECSP closed a net of 25 Corrective Action Tracking Documents (CATDs). No Level I deviations were approved during this period. In summary, for the period from January 1, 1994 through December 31, 1994, a total of 254 CATD Corrective Action Plan (CAP) deviations were approved (52 Level IIa, 37 Level IIb, and 165 Level III).

At the request of the Nuclear Regulatory Commission (NRC), a special report was submitted on October 31, 1994. This special report contained information describing CATD CAP deviations approved in support of Watts Bar Nuclear Plant (WBN) Unit 1 startup during the period January 1, 1994 through October 31, 1994. The special report documented 44 approved WBN-specific CAP deviations and 14 approved nonplant specific (NPS) CATD CAP deviations. In order to minimize duplication, this Seventh Annual Report will not include the details regarding the approved CATD CAP deviations described in the special report submitted on October 31, 1994. Rather, TVA will be happy to provide a separate copy of the October 31, 1994 special report should that be necessary. This report (Seventh Annual Report) documents the remaining CATD CAP deviations which were approved between January 1, 1994 and December 31, 1994. This report documents 21 Level IIa deviations, 10 Level IIb deviations, and 165 Level III deviations.

Section 2.0 of this report provides background information on the ECSP. Section 3.0 contains a summary of the status of CATDs resulting from the ECSP evaluations that have been implemented and verified complete through December 31, 1994. Section 4.0 of this report summarizes the nature of and technical justification for the Level IIa and IIb CAP deviations identified and approved during the reporting period, and lists identified Level III CAP deviations.

2.0 BACKGROUND

In July 1988, TVA committed to the NRC to provide an annual report of deviations from the ECSP CAPs. These CAPs were developed as part of encompassing CATDs to correct and/or resolve deficiencies or problems arising from the investigation of employee concerns addressed by the ECSP. The employee concerns included in the scope of the ECSP were those collected or otherwise identified before February 1986, and generally dealt with TVA's nuclear program activities between 1980 and 1985.

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This report is the seventh submitted in accordance with a commitment made by TVA to the NRC in July 1988. A synopsis of the events leading to this commitment is provided below.

In February 1986, TVA established the ECSP to evaluate approximately 6,000 employee concerns that had originated primarily at Watts Bar Nuclear Plant (WBN). The major findings, actions, and conclusions resulting from the nearly two years of ECSP evaluations were documented in a series of reports. The last of these reports was submitted to the NRC on February 6, 1989.

On March 11, 1988, the NRC forwarded to TVA its preliminary Safety Evaluations on the ECSP reports relating to Sequoyah Nuclear Plant (SQN). One of these Safety Evaluations dealt with engineering issues of a programmatic nature, primarily organizational and/or procedural problems in the engineering design process. In this particular Safety Evaluation, the NRC made the following statement: "Any additional program changes should be submitted for staff review and should not be implemented prior to review and approval by the staff."

In a letter dated July 6, 1988, from Mr. R. L. Gridley, TVA's Director of Nuclear Licensing and Regulatory Affairs, TVA provided the NRC with comments on the preliminary SQN Safety Evaluations.

In response to the previously quoted statement, TVA committed to submitting to the NRC for review, prior to implementation, any deviation to a CAP commitment that significantly deviates from the original intent of the CAP (Level I). For those CAP deviations not considered to implement such changes (Levels II and III), TVA would notify the NRC in an annual report of all approved deviations to CAPs implemented during the reporting period.

On July 9, 1992, the NRC accepted changes proposed by TVA to the CATD closure process contingent upon the issuance of procedural changes. Nuclear Power Standard STD-1.2, Revision 2, "Concerns Resolution" was issued January 29, 1993 with the changes effective March 30, 1993. Changes are summarized as follows:

1. The Level II CAP deviation definition was refined into Level IIa and IIb. Level IIa deviations must be approved by the Senior Management Review Group as was previously required for Level II deviations. Level IIb deviations must be approved by the Manager, Concerns Resolution Staff.

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2. For Sequoyah, Bellefonte, Browns Ferry Nuclear Plants, and Nonplant Specific (NPS) CATDs which are not WBN specific, CATDs may be closed when the remaining open CAP actions have been properly identified as Nuclear Licensing commitments in accordance with STD-1.2 requirements. Nuclear Licensing and Regulatory Affairs (NLRA) then tracks to completion the remaining corrective actions using the existing NLRA commitment tracking process. The NLRA commitment tracking process, defined by Nuclear Power Standard STD-4.3, "Managing and Tracking NRC Commitments" was revised on April 30, 1993 to address CATD-related commitments.

Effective after March 30, 1993:

Level IIa CAP Deviation - A proposed change to a previously approved Quality-Related (QR) CAP whose implementation would (1) affect multiple plants; or (2) affect a programmatic area of weakness; or (3) deviate from the techniques or methods established by commitments previously made that are outside of normal engineering practices or affect the results; or (4) involve organizational changes that prohibit the implementation of the CAP.

Level IIb CAP Deviation - A proposed change to a previously approved (1) QR CAP whose implementation would deviate from techniques or methods established by the commitments previously made that are not outside of normal engineering practices and do not affect the results; or (2) QR CAP which involves organizational changes that do not prohibit the implementation of the CAP; or (3) Nonquality-related (NQR) CAP whose implementation would affect multiple plants, affect a programmatic area of weakness, deviate from techniques or methods established by the commitments previously made, or involve organizational changes that prohibit the implementation of the CAP.

Level III Deviation - Any other changes to a previously approved CAP that is not classified as Level I, Level IIa or Level IIb.

(Note: The Level I and Level III CAP deviation definitions were not changed. The Level III wording was adjusted to expand "Level II" to "Level IIa or Level IIb.")

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3.0 PROGRAM STATUS AND RELATED ACTIONS

As of December 31, 1994, 1,178 CATDs had been completely implemented by the line organization, verified by the ECSP, and closed.

During the period between January 1, 1994 and December 31, 1994, the ECSP closed a net of 25 CATDs and processed 254 CAP deviations.

Table 1 ⁽¹⁾
CATD Closure and CAP Deviations - 1994
Deviation Level

| SITE | CLOSED ⁽²⁾ | I | IIa | IIb | III |
|-------------------|-----------------------|---|-----|-----|-----|
| Bellefonte | 40 | 0 | 2 | 0 | 30 |
| Browns Ferry | 46 | 0 | 10 | 5 | 35 |
| Nonplant Specific | (-22) ⁽³⁾ | 0 | 14 | 5 | 44 |
| Sequoyah | 13 | 0 | 3 | 2 | 11 |
| Watts Bar | (-52) ⁽³⁾ | 0 | 23 | 25 | 45 |
| | | | | | |
| Total | 25 | 0 | 52 | 37 | 165 |

Table 2 below is a summary of program status through the end of 1994.

Table 2 ⁽¹⁾
CATD Status

| SITE | TOTAL | CLOSED ⁽²⁾ | OPEN |
|-------------------|-------|-----------------------|--------------------|
| Bellefonte | 193 | 184 | 9 |
| Browns Ferry | 359 | 273 | 86 |
| Nonplant Specific | 169 | 116 | 53 |
| Sequoyah | 335 | 327 | 8 |
| Watts Bar | 535 | 278 | 257 ⁽⁴⁾ |
| | | | |
| Total | 1,591 | 1,178 | 413 |

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NOTES:

- 1) The status of CATDs is based on Tracking and Reporting of Open Items as of December 31, 1994.
- 2) The number of CATDs closed in this tables represents the net number closed during the year.
- 3) WBN closed and reopened some CATDs resulting in a net loss in the total number of closed CATDs.
- 4) Two hundred thirty-eight WBN Unit 1 licensing CATDs remain open.

4.0 CAP DEVIATIONS

This section presents a description of Level IIa and IIb CAP deviations approved during the reporting period by location and not reported in the special report submitted to the NRC on October 31, 1994. The original CAP or that portion of the CAP being changed is identified, the CAP revision is described, and a summary of the technical justification supporting the approved CAP deviations is presented. Those CATDs having Level III CAP deviations are identified but not described.

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4.1 Sequoyah Nuclear Plant (SQN)

During this reporting period, there were 3 approved Level IIa CAP deviations, 2 Level IIb CAP deviations, and 11 Level III CAP deviations for SQN CATDs.

4.1.1 Level IIa and IIb CAP Deviations

CATD 11103-SQN-02 (LEVEL IIb DEVIATION) - DNE DISPOSITION OF THE "AS-BUILT" SNUBBERS BY SQN SITE PERSONNEL HAS NOT BEEN RELEASED

CATD 11103-SQN-02 documents the issue that the "as-built" configuration of all 47A053 snubbers by SQN site personnel has been sent to DNE for evaluation. DNE disposition of the "as-built" information has not been released.

Previously Approved CAP

Implement ECNL6237.

Revised CAP

Issue calculations and drawings (or design change authorizations) that qualify and document the actual configuration of the snubber supports that were originally installed using 47A053 typical drawings.

Technical Justification

All the work to satisfy the proposed CAP is complete. As part of the corrective action of Incident Investigation (II) S-93-025, Nuclear Engineering identified all the safety-related snubber supports in the plant. All the typical snubbers supports that were not previously qualified and changed to engineered support numbers were qualified and given unique drawing numbers as a part of this effort. This work was done under DCNS09454.

A list of all the safety-related snubber supports is contained in DCNQ10020 which was also issued as part of the corrective action of II-S-93-025. As shown in this listing, all snubber supports are now identified by unique engineered support numbers. Those that were originally installed using the 47A053 typical drawings are identified in this listing.

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Configuration control, as designed drawings or DCAs posted against the unique drawing numbers have been issued that documents the actual as-constructed configuration of all the snubber supports. Calculations qualifying the as-constructed configuration have also been issued for each support. Field Change Requests (FCRs) may exist against supports that are now documented with as-designed drawings, but the FCRs have been qualified in the calculations and are posted against the drawings.

The original scope of ECN L6237 was for safety-related snubbers only. The 47A053 typical snubber drawings were issued for only safety-related applications. Therefore, there is no reduction in the scope of the commitment, only clarification.

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CATD 22301-SQN-01 (LEVEL IIa DEVIATION) - UNAUTHORIZED UNISTRUT CLAMPS

CATD 22301-SQN-01 documents the issue "SQN response to WBN-SCR 6084-S dated 12/13/85 identifying 17 types of Unauthorized Unistrut clamps is being reviewed by TVA.

Previously Approved CAP

SQN review of the WBN SCR based on construction input indicates that some of the clamps identified in WBN-SCR 6084-S have been received at SQN. However, a review of the results from the in-place torque program on unistrut type supports (SMI-0-317-29-1) revealed that none of the unauthorized clamps showed up in any of the unistrut populations that were sampled. There is a high probability that the unauthorized clamps were not used for Category I installations at SQN.

Revised CAP

1. Determine if any of the 17 clamp types were procured at SQN for use on instrument tubing.
2. If clamps were procured, determine likelihood of their usage as instrument line supports, and further action (if any) required.

Technical Justification

This CATD is summarized as follows: "SQN response to WBN-SCR 6084-S dated 12/13/85 identifying 17 types of unauthorized Unistrut clamps is being reviewed by TVA." The considerations at SQN are (1) whether unauthorized instrument line clamps were installed SQN in the past, and (2) whether unauthorized instrument line clamps could be installed in the future. Item (1) is covered by this CATD. Item (2) is covered by CATD 22301-SQN-03.

BACKGROUND - WBN NCR 6084 RO, initiated 5/23/85 (C24850606100) states that Unistrut part number P2911 clamps were used at WBN on seismic supports for 1/2" instrument lines. It indicated that part number P2911 is fabricated similar to part number P1111, and the two could mistakenly be interchanged unless the part numbers were checked. The NCR was distributed to other plants for generic evaluation (B41851024003). Attachment B included a list of 17 unauthorized clamp types (including number P2911) to be evaluated. Later, WBN SCR 6084-S RO dated 12/13/85

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Later, WBN SCR 6084-S RO dated 12/13/85 (W860822K0252) was issued on the same subject. It stated that the condition resulted each time a drawing was issued which specified the use of any of the 17 clamp types.

At SQN, SCR SQNCEB8612 was written to broadly address concerns regarding the proper specification and usage of clamps for pipe, conduit, and instrument line supports, and their proper bolt tightening. The SCR scope included Unistrut and B-E pipe clamps. Attachment A of the Employee concern package includes a 12/15/86 memo from R. W. Olson to M. R. Harding (S02861215937). This memo documents that Construction purchase contract records were searched, and of the 17 clamp-types, only the following were procured: P1115, P1117, P1119, P1121, P1118, and P1123. As can be seen in the Unistrut catalog, these clamps are 2-piece one-bolt clamps for rigid steel conduit. The results of a walkdown and engineering evaluation of piping, conduit and instrument lines are documented in a memo from R. E. Field to SQN files dated 8/15/86 (B25860815019). One of the conclusions is that all Unistrut conduit clamps are qualified for the short and long term. This includes the six clamp types listed above. Note that conduit clamps could not have been used for instrument lines because of the difference in outside diameters between tubing and conduit. Therefore, there is no potential for installation of unauthorized clamps on instrument lines at SQN.

R1 to the Final Element Report (T25870121948, page 9 of 16) also concluded that concerns "regarding the use of unauthorized clamps is not valid for SQN Seismic Category I and I(L) instrument line supports." Ambiguity existed however, in the specification of Unistrut clamp types on instrumentation support drawings. This will be considered separately under the heading of CATD 22301-03.

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**CATD 22301-SQN-02 (LEVEL IIa DEVIATION - LACK OF SPECIFIC
TIGHTENING INSTRUCTIONS FOR INSTRUMENT LINE CLAMPS**

CATD 22301-SQN-02 documents the issue that SCR SQNCER8612 identified lack of specific tightening instructions for original installation of Unistrut bolts for instrument line clamps.

Previously Approved CAP

SQN review of the WBN SCR based on construction input indicates that some of the clamps identified in WBN-SCR 6084-S have been received at SQN. However, a review of the results from the in-place torque program on unistrut type supports (SMI-0-317-29-1) revealed that none of the unauthorized clamps showed up in any of the unistrut populations that were sampled. There is a high probability that the unauthorized clamps were not used for Category I installations at SQN.

Revised CAP

1. Tighten Unistrut bolts for instrumentation tubing within the bounds of the Bolt Tightening Program for rigorously & alternately analyzed piping, conduit and tubing. Reference SCR SQNCEBB612.
2. Walk down and tighten all bolts for instrument lines necessary to detect, monitor, and/or mitigate FSAR Chapter 15 events. Note: This activity resulted from the resolution of CAR 87-014. SMI-1-317-26 and SMI-0-317-61 were the implementing documents.
3. Implement a post-restart program for all future installation, modification, maintenance & inspection of supports for instruments lines. Note: This program has been established, and is currently controlled under Eng. Specification N2E-884.

Technical Justification

CATD 22301-SQN-02 is summarized as follows: "SCR SQNCEB8612 identified lack of specific tightening instructions for original installation of Unistrut bolts for instrument line clamps." See Attachment A for the current CAP, approved 1/12/87, covering CATDs 22301-SQN-01, -02, and -03. The main issue related to proper specification, usage and torquing of Unistrut supports for instrument lines. The Bolt-Tightening Program and SCR SQNCEB8612, referred to in the current CAP, remedied supports for Rigorously

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and Alternately Analyzed piping, conduit, and instrument lines. Although full credit should be taken for work done on instrument lines under the Bolt-Tightening Program, it is necessary to add credit for work done under CAR 87-014, as discussed below.

The Bolt-Tightening Program and SCR SQNCEB8612 resolution included a sampling program to evaluate as-installed Unistrut clamps on piping, conduit and instrument lines. The resolution of SCR SQNCEB8612 and completion of the Bolt-Tightening Program are well documented in the CATD package. The engineering evaluation (calc. SQCG1006, B25861021800) concluded that tubing (instrument line) supports were adequate for restart of the units, and that tubing should be reinspected and corrected as required before return to service for U2C4 and U1C5. A "life of plant" maintenance program was to be established to assure the continuance of proper torques for tubing clamp bolts. These conclusions were documented in a memorandum, Roger E. Field Jr. to SQN Project Files dated 8/15/86 (B25860815019) - copy is in the CATD closure packages.

Under CAR 87-014, many issues related to instrument line installation were addressed. Proper bolt tightening was one of the issues which were addressed and remedied under the CAR. Prior to restart, 236 instrument line in Unit 1 and 647 in Unit 2 were inspected and corrected under SMI-1-317-26 and SMI-0-317-61. The walkdowns and corrections (as required) included all instrument lines required to detect, monitor, and/or mitigate FSAR chapter 15 events. This is described in the SNP Bolt Tightening Program Study Phase Report (sections 3.0-3.7). CAR 87-014 also instituted a "life of plant" maintenance program to assure the continuance of proper torques for instrument line clamp bolts. This post restart program for tubing inspection was put into place under Engineering Requirements Specification (ERS) ER-SQN-EEB-001. The ER covered all future installation, modification, maintenance and inspection of supports for instrument lines. The requirements of this ER are now found in Engineering Specification N2E-884 (S22910523700).

TVA's original commitment to the NRC under CAR 87-014 was to initiate, complete, and document a Phase II instrument project for safety-related instruments not included in Phase I. This commitment was revised in a letter to NRC dated June 7, 1989 (L33890607902). In this letter, TVA concluded that "The remainder of the discrepancies required minor field work, such as tightening or replacement of bolts and nuts, to correct the discrepancies. A comprehensive program is being implemented to ensure that the established baseline for these instruments is maintained over the life of the plant." This TVA revision was accepted by NRC. The life-of-plant program for all safety-related instruments was defined at that time under ER-SQN-EEB-001 as discussed above.

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CATD 22301-SQN-03 (LEVEL IIa DEVIATION) - DRAWINGS HAVE BROAD RANGE OF UNISTRUT CALLOUTS

CATD 22301-SQN-03 documents the issue that a few drawings in the 47A051, 052 and 054 series have a broad range of Unistrut (P2000) callouts.

Previously Approved CAP

SQN review of the WBN SCR based on construction input indicates that some of the clamps identified in WBN-SCR 6084-S have been received at SQN. However, a review of the results from the in-place torque program on unistrut type supports (SMI-0-317-29-1) revealed that none of the unauthorized clamps showed up in any of the unistrut populations that were sampled. There is a high probability that the unauthorized clamps were not used for Category I installations at SQN.

Revised CAP

1. Revise drawings to eliminate the "broad range" callouts, and to include callouts for specific approved clamp types.
2. Revise drawings to provide torque requirements for all clamp types which have been specified in (1) above.

Technical Justification

CATD 22301-SQN-03 is summarized as follows: "A few drawings in the 47A051, 052, and 054 series have a broad range of Unistrut (P2000) clamp callouts." This is correct, in that a few drawings in the above series called out "Unistrut P2000 series" instrument line clamps. Additionally, drawing 47A050-17 did not specify torque values for all clamp types. The above instrument line support drawings were revised to replace the ambiguous clamp callout with specific callouts, and to provide torque requirements for each clamp type on drawing 47A050-17. These changes were made as part of the resolution of SCR SQNCEB8612.

The above actions were taken to preclude any future inadvertent installation of unauthorized clamps. Refer to revision 1 to Final Element Report 223.1(B) (T25870121948). On page 6 of 14, item iv noted that 120 instrument line clamps were randomly inspected, and no unauthorized clamp type was found. Item v acknowledges

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that a few drawings in the 47A051, 47A052, and 47A053 series had a "Unistrut P2000" callout for instrument line clamps, and that the Unistrut series has many clamps which do not have any torque value specified on drawing 47A050-17. Subsequently, appropriate drawings were revised to eliminate any ambiguity as to which specific clamps were required. Page 7 of the Element Report concurs with the findings of the TVA Generic Concerns Task Group that "47A050 series drawings and notes at SQN are not confusing for instrument tubing clamps. Therefore, SQN Construction and QC should not have had difficulty in interpreting and implementing the requirements."

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CATD SWEC-SQN-13-01 (LEVEL III DEVIATION) - VOLUME OF PLANT LEAKAGE REQUIRE FULL-TIME OPERATIONS OF LIQUID RADWASTE SYSTEM

CATD SWEC-SQN-13-01 documents the issue that the volume of plant leakage (Units 1 & 2) require full-time operations of Liquid Radwaste System.

Previously Approved CAP

The original CAP is missing the required approval signature.

Revised CAP

An independent outside evaluation is scheduled to (1) identify and evaluate individual rad waste leakage sources, and (2) evaluate the overall rad waste system with recommendations for modifications as needed.

After the evaluation is completed, additional corrective action may/may not be required.

Technical Justification

The originally approved CAP is missing the required approval signature. No changes in the original CAP are requested. This deviation is submitted in accordance with Site Standard Practice SSP-1.2.

4.1.2 Level III CAP Deviations

There are 11 Level III CAP deviations identified for the following SQN CATDs:

| <u>CATD</u> | <u>Deviations</u> |
|--------------|-------------------|
| 11300-SQN-08 | 1 |
| 11301-SQN-08 | 1 |
| 30601-SQN-02 | 2 |
| 30713-SQN-02 | 7 |

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4.2 Browns Ferry Nuclear Plant (BFN)

During this reporting period, there were 10 approved Level IIa CAP deviations, 5 Level IIb CAP deviations, and 35 Level III CAP deviations for BFN CATDs.

4.2.1 Level IIa and IIb CAP Deviations

CATD 10400-BFN-06 (UNIT 3 ONLY; LEVEL IIa DEVIATION - BASEPLATE FLEXIBILITY ANALYSIS CRITICAL TO RESIDUAL HEAT REMOVAL (RHR))

CATD 10400-BFN-06 (Unit 3) documents the issue that the baseplate flexibility analysis critical to RHR piping support R159 U3 was not considered in the calculation

Previously Approved CAP

Since 1981, BFEP has had an internal requirement to consider plate flexibility in piping support design. This memorandum was incorporated in the General Reference Calculation in July 1984 (BWP 840713 103). Since various calculation reviews by TVA as well as a review by Bechtel did not identify other supports with this deficiency, it is TVA's position that the baseplate flexibility concern on RHR Support R159 (U3) is an isolated case caused by designer error.

Since no generic implications exist, the remedial corrective action will be for BFEP to perform an appropriate flexible plate analysis for the RHR Support R159. No additional calculation review is required.

Piping supports installed in 1980 and before will be analyzed under one of the programs described in the Nuclear Performance Plan, Volume 3, Section III. The recurrence control measures described below will prevent repetition of this deficiency when calculations are generated or revised for these programs.

To ensure that the personnel involved in support design at BFN are fully aware of flexible plate design requirements, a memorandum (with training roster) will be distributed to all BFEP piping support designees by July 31, 1987, instructing them of the requirements of using flexible plate analysis. Requirements for flexible plate design are included in the TVA Civil Design Standard DS-C1.7.1, titled "General Anchorage to Concrete," and will be incorporated in the Pipe Support Design

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Handbook, currently under review before initial issue. When completed, these actions are expected to prevent future occurrence of this deficiency.

Revised CAP

The base plate flexibility concern on RHR support R159 Unit 3 is an isolated case caused by designer error.

Technical Justification

CAQR BFPB870514PER was initiated to document and correct the discrepancy on RHR support R159. The 79-02/79-14, CRDH, Small Bore Piping/Tubing and LTTIP programs are in place, and are being implemented to analyze and resolve any piping support issues identified.

Requirements for "flexible" place design requirements are included as part of both, the TVA "Civil Design Standards" and the "Pipe Support Design Handbook," and designers are aware of these requirements.

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**CATD 17300-BFN-04 (UNITS 1 AND 3; LEVEL II_a DEVIATION) - REVIEW
BACKFILLING PROCEDURES FOR MINIMUM FLOW RATES AND
RESTRICTIONS**

CATD 17300-BFN-04 (Units 1 and 3) documents the issue that ONP BFN should contact DNE EEB to review backfilling procedures for minimum flow rates and restrictions on backfilling cold demin water back to a hot process nozzle.

Previously Approved CAP

1. Review design basis to verify adequacy/appropriateness of existing design specifications relating to line slope/inline valve orientation.
2. Generate, revise, or supplement criteria, as necessary, to establish minimum acceptable design requirements.
3. Identify instrument line population to be reviewed.
4. Identify instrument line subset of item #3 required to be reviewed to support unit 2 restart. Population will include instrument lines serving safe shutdown instrument population, including post accident monitoring (PAM) instrumentation. Population will be established using design output documentation, 10CFR50.49 program documentation, and the design baseline verification program safe shutdown boundary analysis.
5. Review operation and maintenance records available to establish technical justification of existing configuration, maintenance procedures for normal operation.
6. Review design output documentation for adequacy in delineating minimum acceptable requirements as identified in item 2 above. Verify as-constructed status for drawings with requirements adequately specified; if as-constructed configuration meets minimum requirements no further review is necessary for those items; document review within appropriate procedures.
7. Identify, develop technical justification to establish any item 4 population line as acceptable-as-is. Examples include: A) Gauge pressure instruments operating at setpoints large enough that error induced by improper slope will not shift setpoint to outside of limits. B) Instrumentation which would achieve safety function (fail-safe) due to error induced by effects of improper slope. Additional basis for technical justification is under development. Each item #4 line for which technical justification to accept-

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as-is can be developed will require no further review prior to restart; document review following appropriate procedures.

8. The remainder of the item 4 population following elimination by items 6 and 7 of those lines known to meet the minimum design requirements (item 6) or technical justification can be developed to accept-as-is (item 7) will require verification of the installed configuration. A walkdown, using appropriate instructions, will document the installation, utilizing design developed acceptance criteria, as meeting design specification or as failing to meet minimum criteria.
9. Installations found to not achieve minimum criteria will be identified and minimum remedial corrective action will be established as well as a schedule for implementation. Physical modification will be performed under appropriate change control procedures.

RECURRENCE CONTROL

An Engineering Requirements Specification (ER Spec) is in preparation and will provide installation and inspection criteria for instrument lines, including slope and valve orientation. Design output documents identified in item 6 of the corrective action will, as required, be revised to specify appropriate requirements. Design basis review and verification associated with items 1 and 2 will establish design input.

Revised CAP

Issue and implement Unit 1 and 3 maintenance instructions for backfilling instrument lines on water systems that attach to the reactor vessel. These instructions shall address pertinent parameters such as backfill flow rate and restrictions on backfilling cold water back to a hot process nozzle.

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Technical Justification

The original CAP was generated prior to understanding what specific actions were needed to address this CATD. Thus, the CAP was very general and delegated the corrective actions to a Unit 2 CAQR on instrument line slope. In the course of evaluating the CATD further, it became obvious that a standard backfilling instruction which included pertinent parameters such as backfill flow rate was needed to satisfy the CATD and that there was no direct correlation with the CAQR. (Note: In closing the CATD for Unit 2 restart, steps were added to the CAQR to address the CATD. This was principally done as a scheduling action since the CAQR had no correlation to backfilling methods. Refer to previous Unit 2 closure documentation for further clarification on this.) The Unit 2 CAQR is closed and the CATD was closed for Unit 2 by issuing backfill procedures.

Issue and implementation of the analogous Unit 1 and 3 procedures will complete the CATD. The Unit 2 instruction will serve as a model for the Unit 1 and 3 procedures.

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CATD 21502-BFN-01 (UNITS 1 AND 3 ONLY; LEVEL IIa DEVIATION - CUT REBAR EFFECTS AND HANGER LOADS ON STRUCTURES)

CATD 21502-BFN-01 (Units 1 and 3) documents the issue that a) no assessment has been made for cut rebar effects; b) hanger loads on structures have not been integrated with the assessment of cut rebar effects; and c) no documented procedures or programs are in place to ensure compliance with FSAR licensing commitments for structures relative to control of cut rebar and hanger loads on structures.

Previously Approved CAP

Will not require a random sample and drawings. Instead, a team of experienced engineers will walk through the entire reactor building (with the exclusion of the interior of the drywell) and look for sample concrete elements most highly stressed by attachment loads. These samples will represent worst case conditions. Reflects work performed by TVA personnel and contract personnel.

Revised CAP

For Units 1 & 3:

Unit 2 columns, walls and slabs which were determined to be the most highly stressed, will be the basis for the Unit 1 & 3 evaluation.

A team of experienced engineers will examine in Units 1 & 3 the same Unit 2 elements which were deemed to be the most highly stressed. If the numbers, size and location of attachments are judged to be equal to or less than Unit 2, then the Unit 2 evaluation will become the basis for the other unit. If the similar areas in Unit 1 & 3 are judged to be more heavily loaded than the Unit 2 highly stressed elements, further evaluation will be performed. Units 3 & 1 will be evaluated prior to restart of the respective unit. This program as outlined will cover only Class I concrete elements. BFEP-DI-C5 (Concrete Reinforcement Bar Cutting Evaluation and Documentation) has been issued and implemented site-wide which describes the methods by which reinforcing bar cuts are cumulatively evaluated. It also provides the method for documenting such evaluations in a chronological and systematic manner.

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Technical Justification

For BFN Unit 2, this CATD was implemented using the approved CAP deviation and for BFN Unit 2, this CATD is closed. Unit 1 and Unit 3 are similar to Unit 2. Because Unit 2 is the common unit between Units 1 & 3 and is the location/pathway for systems common to all three units, it will have the most attachments to its concrete elements and therefore, concrete verification results for Unit 2 encompasses Units 1 & 3 in terms of loading. Hence, most highly stressed concrete elements in Unit 2 can be the basis for the Units 1 & 3 evaluation. Concrete features inside the drywell (base slab, reactor pedestal and sacrificial shield wall) were excluded in Unit 2 because of their low potential for unaccounted attached loadings and cut reinforcing bars.

This proposed CAP only avoids rewalk of the plant to determine the critical elements. The Problem Description in CATD No. 21502-BFN-01 includes the problems described in CATD Nos. 21506-BFN-01 and 21506-BFN-06. Also, the proposed CAP here resolves the problems described in all of these three CATDs.

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**CATD 21506-BFN-01 (UNITS 1 AND 3 ONLY; LEVEL II_a DEVIATION -
CATEGORY I CONCRETE INSTRUCTIONS ARE NOT AVAILABLE**

CATD 21506-BFN-01 documents the issue that Units 1, 2 & 3 design calculations considering cumulative effects of as built hangars combined with cut rebars evaluation on category I concrete structures are not available.

Previously Approved CAP

Will not require a random sample and drawings. Instead, a team of experienced engineers will walk through the entire reactor building (with the exclusion of the interior of the drywell) and look for sample concrete elements most highly stressed by attachment loads. These samples will represent worst case conditions. Reflects work performed by TVA personnel and contract personnel.

Revised CAP

For Units 1 & 3:

Unit 2 columns, walls and slabs which were determined to be the most highly stressed, will be the basis for the Unit 1 & 3 evaluation.

A team of experienced engineers will examine in Units 1 & 3 the same Unit 2 elements which were deemed to be the most highly stressed. If the numbers, size and location of attachments are judged to be equal to or less than Unit 2, then the Unit 2 evaluation will become the basis for the other unit. If the similar areas in Unit 1 & 3 are judged to be more heavily loaded than the Unit 2 highly stressed elements, further evaluation will be performed. Units 3 & 1 will be evaluated prior to restart of the respective unit. This program as outlined will cover only Class I concrete elements. BFEP-DI-C5 (Concrete Reinforcement Bar Cutting Evaluation and Documentation) has been issued and implemented site-wide which describes the methods by which reinforcing bar cuts are cumulatively evaluated. It also provides the method for documenting such evaluations in a chronological and systematic manner.

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Technical Justification

For BFN Unit 2, this CATD was implemented using the approved CAP deviation and for BFN Unit 2, this CATD is closed. Unit 1 and Unit 3 are similar to Unit 2. Because Unit 2 is the common unit between Units 1 & 3 and is the location/pathway for systems common to all three units, it will have the most attachments to its concrete elements and therefore, concrete verification results for Unit 2 encompasses Units 1 & 3 in terms of loading. Hence, most highly stressed concrete elements in Unit 2 can be the basis for the Units 1 & 3 evaluation. Concrete features inside the drywell (base slab, reactor pedestal and sacrificial shield wall) were excluded in Unit 2 because of their low potential for unaccounted attached loadings and cut reinforcing bars.

This proposed CAP only avoids rewalk of the plant to determine the critical elements. The Problem Description in CATD No. 21502-BFN-01 includes the problems described in CATD Nos. 21506-BFN-01 and 21506-BFN-06. Also, the proposed CAP here resolves the problems described in all of these three CATDs.

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**CATD 21506-BFN-02 (UNITS 1 AND 3 ONLY; LEVEL II_a DEVIATION -
WRITTEN PROCEDURE COMBINED WITH CUT REBAR EVALUATION DO
NOT EXIST**

CATD 21506-BFN-02 documents the issue that Units 1, 2 & 3 written procedure and program for assessing cumulative effects of hanger loads combined with cut rebar evaluation do not exist.

Previously Approved CAP

Will not require a random sample and drawings. Instead, a team of experienced engineers will walk through the entire reactor building (with the exclusion of the interior of the drywell) and look for sample concrete elements most highly stressed by attachment loads. These samples will represent worst case conditions. Reflects work performed by TVA personnel and contract personnel.

For corrective action plan, see CAP for CATD 21502-BFN-01.

Revised CAP

For Units 1 & 3:

Unit 2 columns, walls and slabs which were determined to be the most highly stressed, will be the basis for the Unit 1 & 3 evaluation.

A team of experienced engineers will examine in Units 1 & 3 the same Unit 2 elements which were deemed to be the most highly stressed. If the numbers, size and location of attachments are judged to be equal to or less than Unit 2, then the Unit 2 evaluation will become the basis for the other unit. If the similar areas in Unit 1 & 3 are judged to be more heavily loaded than the Unit 2 highly stressed elements, further evaluation will be performed. Units 3 & 1 will be evaluated prior to restart of the respective unit. This program as outlined will cover only Class I concrete elements. BFEP-DI-C5 (Concrete Reinforcement Bar Cutting Evaluation and Documentation) has been issued and implemented site-wide which describes the methods by which reinforcing bar cuts are cumulatively evaluated. It also provides the method for documenting such evaluations in a chronological and systematic manner.

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Technical Justification

For BFN Unit 2, this CATD was implemented using the approved CAP deviation and for BFN Unit 2, this CATD is closed. Unit 1 and Unit 3 are similar to Unit 2. Because Unit 2 is the common unit between Units 1 & 3 and is the location/pathway for systems common to all three units, it will have the most attachments to its concrete elements and therefore, concrete verification results for Unit 2 encompasses Units 1 & 3 in terms of loading. Hence, most highly stressed concrete elements in Unit 2 can be the basis for the Units 1 & 3 evaluation. Concrete features inside the drywell (base slab, reactor pedestal and sacrificial shield wall) were excluded in Unit 2 because of their low potential for unaccounted attached loadings and cut reinforcing bars.

This proposed CAP only avoids rewalk of the plant to determine the critical elements. The Problem Description in CATD No. 21502-BFN-01 includes the problems described in CATD Nos. 21506-BFN-01 and 21506-BFN-06. Also, the proposed CAP here resolves the problems described in all of these three CATDs.

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**CATD 22600-BFN-01 (LEVEL IIa DEVIATION) - SEISMIC INTERACTION
EVALUATIONS**

CATD 22600-BFN-01 documents the issue that for Units 1, 2 & 3: a) Need satisfactory resolution of SCR BFN MEB 8605 to address seismic interaction between as-built class I and class II components (including lighting fixture supports); and b) No complete program exists to describe and control the seismic interaction evaluations for current and future design activities.

Previously Approved CAP

A seismic interaction program (which will include lighting fixtures) is currently being developed. This program will include a walkdown to identify II/I seismic interaction between as-built class I and class II components as well as evaluation methodology and any resultant fixes as required.

Generic letter 87-02 written by NRC notes that special seismic instructions will be included in the scope of the evaluation for those essential components to achieve safe shutdown following a design base earthquake when Unresolved Safety Issues (USI) A-46 is implemented. Resolution of USI A-46 is not a Unit 2 start up item. Consequently, class II/I evaluation for seismic interaction would not be resolved until the BFN plant unique USI A-46 program is undertaken. The program for controlling future class II/I considerations for BFN will be developed prior to completion of the baseline A-46 effort. This program will be controlled as outlined in design interface document CEB-DI-121.03 R2 and future version of that document. This program is applicable for BFN units 1, 2 & 3.

Revised CAP

Unit 2:

During the unit 2 cycle 5 outage, EQE Engineering performed a seismic-induced spray hazard program for unit 2 and common areas, which is documented in calculation CD-Q0999-910005 (RIMS: B22 910215 101). This program included the following three elements:

- i) In-plant screening evaluation to identify potential fluid spray hazards as evidenced by past major earthquakes using Walkdown Procedure WDP EQE-001 (RIMS: B22 880414 304).

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ii) Further evaluation of identified potential outliers, based on an established acceptance criteria, CEB Instruction No. CEB-CI 21.103 (RIMS: B41 880311 008).

iii) Recommendation of plant modifications for resolution of outliers, using Maintenance Requests and DCN-W6035 which is now closed.

Implement seismic systems interaction evaluations as part of the resolution of Unresolved Safety Issue USI A-46 program. A base line will be established after completion of walkdown/evaluation of plant equipment using USI A46 methodology. At the completion of the USI A46 review, Design Criteria BFN-50-C-7100 will be revised to adopt USI A46 method for the design of new and replacement commodities.

Unit 3:

A program, similar to Unit 2 was also performed by EQE International for Unit 3. This program is documented in EQE Report No. 51001.23-R-001, which is filed with calculation CD-03999-931257 (RIMS: R14 931110 108). Modifications were issued via DCN-W22556.

Implement seismic systems interaction evaluations as part of the resolution of Unresolved Safety Issue USI A-46 program. A base line will be established after completion of walkdown/evaluation of plant equipment using USI A46 methodology. At the completion of the USI A46 review, Design Criteria BFN-50-C-7100 will be revised to adopt USI A46 method for the design of new and replacement commodities.

Unit 1:

A program, similar to the other two units will be performed for Unit 1. Also note that in future, per Design Criteria BFN-50-C-7100, Attachment-F, Note-6 for Table 4.3.2, any Class II feature in Class I structure, including lighting fixtures shall also be designated for DBE (seismic) load combination.

Technical Justification

- Design Criteria BFN-50-C-7100, Attachment-F, Note-6 for Table 4.3.2 states that Class II structures contained in Class I structures shall also be designed for DBE

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(seismic) load combination. Lighting fixtures are included in this scope. Hence, there is no need to have an additional control as proposed earlier.

- The spray hazard program, as described in the Proposed corrective Action Plan, coupled with seismic systems interaction evaluation to be implemented as part of the resolution of Unresolved Safety Issues USI A-46 program, provides sufficient basis for the closure of SCR BFN MEB 8605.

Adoption of USI A46 methodology for future installations will ensure resolution of seismic interaction problem, if any, for future installations.

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CATD 22901-BFN-01 (LEVEL IIb DEVIATION; UNIT 1 ONLY) - HOLE SIZING INACCURACIES

CATD 22901-BFN-01 (Unit 1 only) documents the issue that vendors orifice hole sizing mechanisms include engineering design inaccuracies. Loop accuracy calculations do not yet exist to account for these hole sizing inaccuracies, and to compare the calculated loop inaccuracies to the appropriate safety limits per design standard DS-E18.1.10. These loop accuracy calculations would be required for the orifices used for quantitative applications to assure correct operations.

Previously Approved CAP

A TVA loop accuracy verification program which is now in progress for all safety-related systems, is required to address engineering design inaccuracies in the loop accuracy calculations. These inaccuracies include the difference between the "Plant" and "Precise" hole-sizing methods.

With completion of calculations, the appropriate comparison to the safety limits per DS-E18.1.10 will be made to provide assurance to accuracies of these orifice holes.

The loop accuracy calculations for safety-related systems are scheduled in P2 activity program, and is scheduled to be completed before unit 2 restart.

Revised CAP

No change was required for the first paragraph.

Requirements for Setpoint Calculations and the minimum requirements for a loop accuracy verification program are established in EEB-TI-28 "Setpoint Calculations."

Before Unit 1 restart, prepare calculations which show that the loops will adequately perform their intended function.

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Technical Justification

EEB-TI-28 defines the minimum requirements for a loop accuracy verification program that assures setpoints are established and held within analytic/safety limits. Loops which required "precise" calculations are supported by scaling and setpoint calculations which includes the orifice plate inaccuracy and shows that the loop will adequately perform its intended function.

Each of the loops which required "precise" calculations is supported by a Scaling and Setpoint Calculation which includes the orifice plate inaccuracy and shows that the loop will perform its intended function and operate within the bounds established by the Analytical Limits. Unit 2 and Unit 3 activities have been completed and this package is for Unit 1.

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CATD 22901-BFN-01 (LEVEL IIb DEVIATION; UNIT 3 ONLY) - HOLE SIZING INACCURACIES

CATD 22901-BFN-01 (Unit 3 only) documents the issue that vendors orifice hole sizing mechanisms include engineering design inaccuracies. Loop accuracy calculations do not yet exist to account for these hole sizing inaccuracies, and to compare the calculated loop inaccuracies to the appropriate safety limits per design standard DS-E18.1.10. These loop accuracy calculations would be required for the orifices used for quantitative applications to assure correct operations.

Previously Approved CAP

A TVA loop accuracy verification program which is now in progress for all safety-related systems, is required to address engineering design inaccuracies in the loop accuracy calculations. These inaccuracies include the difference between the "Plant" and "Precise" hole-sizing methods.

With completion of calculations, the appropriate comparison to the safety limits per DS-E18.1.10 will be made to provide assurance to accuracies of these orifice holes.

The loop accuracy calculations for safety-related systems are scheduled in P2 activity program, and is scheduled to be completed before unit 2 restart.

Revised CAP

No change was required for the first paragraph.

Requirements for Setpoint Calculations and the minimum requirements for a loop accuracy verification program are established in EEB-TI-28 "Setpoint Calculations."

Prepare calculations which show that the loops will adequately perform their intended function.

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Technical Justification

EEB-TI-28 defines the minimum requirements for a loop accuracy verification program that assures setpoints are established and held within analytic/safety limits. Loops which required "precise" calculations are supported by scaling and setpoint calculations which includes the orifice plate inaccuracy and shows that the loop will adequately perform its intended function.

Each of the loops which required "precise" calculations is supported by a Scaling and Setpoint Calculation which includes the orifice plate inaccuracy and shows that the loop will perform its intended function and operate within the bounds established by the Analytical Limits. Unit 2 activities have been completed and this package is for Unit 3.

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**CATD 22902-BFN-01 (LEVEL IIb DEVIATION) - POTENTIALLY
RADIOACTIVE PANEL DRAINS ROUTED INTO FLOOR DRAINS INSTEAD
OF INTO CLOSED DRAINAGE SYSTEMS**

CATD 22902-BFN-01 documents the issue that as defined in Appendices B and C of the applicable ECTG report, there are potentially radioactive panel drains routed into floor drains instead of into closed drainage systems

Previously Approved CAP

PIRBFNEEB8750 R1 has been initiated to track this proposed corrective Action Plan: Corrective action will consist of modifying all of the items listed below to bring them in compliance with the BFN design basis.

Connect drain of Panel 1-25-126 to the radwaste floor drain system, or cap.

Panels 3-25-116A-C have been capped, drawing will be corrected to reflect capping.

Drains of unit 1 and 2 Non-Regenerative HTX sampling stations will be extended to the floor drain.

Unit 3 Non-Regenerative HTX sampling station will be routed to floor drain system not the equipment drain system.

Prior to restart, Radiation Control Engineering will provide the necessary connection of Unit 1 & 2 sampling drains to floor drains.

Rad Waste Engineering has walked down the following panels to determine whether there is a need for metallic plugs to be added for identified drain pipes:

| | | |
|-------------|-----------|-----------|
| 3-25-050 | 0-25-087 | 3-25-105 |
| 3-25-063 | 0-25-088 | 3-25-130 |
| 0-25-071A-D | 0-25-090 | 2-25-151J |
| 0-25-072 | 0-25-091 | 2-25-152 |
| 0-25-073 | 0-25-092 | 0-25-211 |
| 0-25-074 | 3-25-101A | 0-25-215 |
| 0-25-077 | 1-25-105A | |

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0-25-084

2-25-105A

It has been determined by Rad Waste Engineering and Health Physics that drain pipes identified have headers filled with de-ionized water which provides a seal to any potential radioactive fluids. Additionally, Health Physics has identified Radiological Instructions RCI 1 & 9, which require the presence of Health Physics Technician during sampling or the draining of these panels. It is the responsibility of the Health Physics Technician to monitor the level of radiation as well as to assure the proper disposal of contaminated fluids. It is determined that there are no further actions necessary for these panels.

Revised CAP

PIRBFNEEB8750 R2 has been initiated to track this proposed Corrective Action Plan: Corrective action will consist of modifying all of the items listed below to bring them in compliance with the BFN design basis.

No change.

No change.

No change.

The unit 3 system is routed to the equipment drain. A DD shall be initiated to show this configuration on applicable drawings. (Equipment drain instead of the floor drain system.)

Site Engineering will issue a Design Change Notice to field implement the proper drain system for units 1&2.

Technical Justification

Revision 2 of the PIR was issued in 1987.

The corrective action for PIRBFNEEB8750 Rev 2 states: "Presently the Unit 3 Non-Regenerative RWCU HTX sampling station is connected to the equipment drain system. A DD shall be initiated to correct how this configuration is reflected on applicable drawings."

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The intent of the EC is to assure that potentially radioactive drains are connected to a system which is processed through the Radwaste System. Both the floor drain (Dirty Radwaste Drain) and the equipment drains (clean Radwaste drain) are routed to radwaste. Therefore, the installed condition is acceptable.

The corrective action for PIRBFNEEB8750 Rev 2 states that the sample drains will be connected to floor drains.

For Unit 2, this activity was removed from the restart schedule. When worked for Units 1 and 2, a DCN will be processed.

Site Engineering will select the proper drain path to connect the Sampling System. RADCON reviews DCNs for ALARA and will have the opportunity to comment on the selection of drain paths.

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**CATD 80202-BFN-01 (LEVEL IIa DEVIATION; UNITS 1 AND 3 ONLY) -
INADEQUATE QA CONTROLS**

CATD 80202-BFN-01 (Units 1 and 3 only) documents the issue that TVA has identified instrumentation deficiencies (CAR-86-0083, 5/16/86; memorandum, RIMS number R32 861010 812, REF. Attachment A) for installation and inspection criteria. As a result of these instrumentation deficiencies, TVA has issued MMI-174 "Replacement of Compression Fittings," Revision 0, 1/14/87; process specification 3.M.13.1 "Specification for installation and inspection of compression fitting joints in mechanical tubing systems," Revision 0, 12/9/85; MAI-41 "Field fouting of instrument impulse lines, sample lines, and control air lines, Revision 0, 12/02/86, CAQR number BFP870014, 3/30/87. (REF. Attachment B) Draft copy of Engineering Specification (ER-BFN-EEB-001, Revision 0) is proposed to be issued for review 4/16/87. Draft copy of QMI 620.2.1 "Indoctrination and training of site QA personnel" has been issued for review.

BFN Site Training was held January 1987 on MAI-41 for several QC Inspectors. POTC will implement a Training Program "Instrument and Line Tube Fitting" for QC Inspectors on April 24, 1987.

Impact on quality of installed hardware has not been addressed. This CATD is issued to track TVA's Corrective Action for the issue that inadequate QA controls are applied to the installation of instrument tubing compression fittings.

Attachment A - Memorandum, RIMS No. R32 861010 812

Attachment B - CAQR No. BFP 870014

Previously Approved CAP

NOTE: FOR UNIT 1 AND 3 ONLY.

Corrective Action for CAQR BFP870305 and CAQR BFP870306:

CAQR BFP870305SCA

1. Review Design Basis and Licensing Commitments to identify minimum appropriate instrument line criteria.

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2. Review existing design input documentation (e.g., 22A1406, 22A1246AC) relating to instrument lines to confirm acceptability in identifying minimum design criteria.
3. If design input is found to be unacceptable; revise, supersede, or supplement documentation to encompass minimum design criteria.
4. Identify instrument line population to be reviewed. Assuming all existing instrument line installation were completed in accordance with USAS B31.1-67 as per 22A1246AC, section 4.2 as a minimum, and in recognition of the G-28 endorsement of USAS B31.1-67 as the BFN code of record; the instrument line population to be reviewed will include only those lines with additional requirements imposed due to their location (i.e., w/1 a seismic category 1 structure) or function (i.e., supports CSSC function as defined by FSAR Appendix D).
5. Review Design Baseline verification program safe shutdown analysis as it relates to instrument line integrity. Verify consistency between its basis and the specific design criteria relating to instrument lines established through activities under items 1, 2, and 3 above. Resolve inconsistencies.
6. Utilizing the baseline verification program safe shutdown analysis boundaries. Identify the instrument population (subset of item 4 population) required to be reviewed to support unit 3 restart.
7. Review existing design output documentation applicable to item 6 population for adequacy in identifying and implementing minimum design criteria as established by items 1, 2, and 3 activities. Document review; particular attention should be paid in recording review where determination is that design output is adequate. Instrument line identification and design documentation, including revision, is minimum acceptable.
8. Each installation identified by the item 7 review as having indeterminate or apparently inadequate design output documentation the following information shall be documented as a minimum.
 - a) Specific instrument line [identified by instrument(s)]; if only a portion of line is involved, identify the specific portion.
 - b) Design output documentation reviewed, including revision.
 - c) Description of perceived deficiency and any criteria which is adequately identified/applied on design output (e.g., it didn't meet class A requirements as defined by G-28; it did meet USAS B31.1-67 and seismic category 1 requirements).

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9. Review available BFN installation, examination, maintenance, and/or operations records relating to these instrument lines to support development of technical justification relative to unit restart.
10. Evaluate each identified deficiency, generic deficiencies may be satisfactorily addressed generically, to disclose impact to unit restart. Evaluation should include consideration of criteria met, vintage of installation [(i.e., what was criteria for installation and documentation at time of design output issue), impact to plant design basis if unresolved (and if partially resolved), activities currently scheduled prior to unit restart which may alleviate or mitigate deficiency (e.g., small bore pipe seismic verification, post modification test programs)].
11. Establish remedial corrective action and develop schedule according to need to accomplish prior to or following unit restart.

RECURRENCE CONTROL

- A. Item 3 with appropriate training will promote recurrence control.
- B. An engineering requirements specification is presented in N1E-003 (previously ER-BFN-EEB-001). This upper-tier design output document provides installation and inspection criteria relating to instrument line work performed in the future.
- C. Existing design output documentation will require revision, as a minimum, to clarify the requirements imposed by the design basis & licensing commitments identified by items 1, 2, and 3 or to reference the specific deviations from these requirements which have been identified, evaluated, and justified as acceptable on an interim basis to support unit restart or as a variance from General Requirements.

CAQR BFP870306PER

1. Review Design Basis and Licensing Commitments to identify minimum appropriate instrument line criteria.
2. Review existing design input documentation (e.g., 22A1406, 22A1246AC) relating to instrument lines to confirm acceptability in identifying minimum design criteria.
3. If design input is found to be unacceptable; revise, supersede, or supplement documentation to encompass minimum design criteria.

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4. Identify instrument line population to be reviewed. Assuming all existing instrument line installation were completed in accordance with USAS B31.1-67 as per 22A1246AC, section 4.2 as a minimum, and in recognition of the G-28 endorsement of USAS B31.1-67 as the BFN code of record; the instrument line population to be reviewed will include only those lines with additional requirements imposed due to their location (i.e., w/1 a seismic category 1 structure) or function (i.e., supports CSSC function as defined by FSAR Appendix D).
5. Review Design Baseline verification program safe shutdown analysis as it relates to instrument line integrity. Verify consistency between its basis and the specific design criteria relating to instrument lines established through activities under items 1, 2, and 3 above. Resolve inconsistencies.
6. Utilizing the baseline verification program safe shutdown analysis boundaries. Identify the instrument population (subset of item 4 population) required to be reviewed to support unit restart.
7. Review existing design output documentation applicable to item 6 population for adequacy in identifying and implementing minimum design criteria as established by items 1, 2, and 3 activities. Document review; particular attention should be paid in recording review where determination is that design output is adequate. Instrument line identification and design documentation, including revision, is minimum acceptable.
8. Each installation identified by the item 7 review as having indeterminate or apparently inadequate design output documentation the following information shall be documented as a minimum.
 - a) Specific instrument line [identified by instrument(s)]; if only a portion of line is involved, identify the specific portion.
 - b) Design output documentation reviewed, including revision.
 - c) Description of perceived deficiency and any criteria which is adequately identified/applied on design output (e.g., it didn't meet class A requirements as defined by G-28; it did meet USAS B31.1-67 and seismic category 1 requirements).
9. Review available BFN installation, examination, maintenance, and/or operations records relating to these instrument lines to support development of technical justification relative to unit restart.
10. Evaluate each identified deficiency, generic deficiencies may be satisfactorily addressed generically, to disclose impact to unit restart. Evaluation should include consideration of criteria met, vintage of installation [(i.e., what was criteria for installation and documentation at

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time of design output issue), impact to plant design basis if unresolved (and if partially resolved), activities currently scheduled prior to unit restart which may alleviate or mitigate deficiency (e.g., small bore pipe seismic verification, post modification test programs)].

11. Establish remedial corrective action and develop schedule according to need to accomplish prior to or following unit restart.

RECURRENCE CONTROL

- A. Item 3 with appropriate training will promote recurrence control.
- B. An engineering requirements specification is in preparation. This upper-tier design output document will provide installation and inspection criteria relating to instrument line work performed in the future.
- C. Existing design output documentation will require revision, as a minimum, to clarify the requirements imposed by the design basis & licensing commitments identified by items 1, 2, and 3 or to reference the specific deviations from these requirements which have been identified, evaluated, and justified as acceptable on an interim basis to support unit restart or as a variance from General Requirements.

Revised CAP

Same as previously approved CAP except:

Eliminate, as a closure requirement for CATD 80202-BFN-01 and 80202-BFN-02, the walkdown requirements of CAQRBFN870305 (Unit 3) and CAQRBFN870306 (Unit 1).

CRS Note: The CAQR numbers are BFP870305SCA and BFP870306PER.

Technical Justification

1. Singleton Materials Engineering Laboratory report conclusions of compression fittings tests indicate that improperly installed fittings will either show obvious leakage or maintain an adequate seal.
2. The several years operation of BFN identified no adverse conditions related to compression fittings (i.e., no leakage).

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3. System testing will be conducted prior to restart of BFN Units 3 and 1, and any leakage compression fittings will be identified and corrected.
4. Certain instrument lines that are not subject to hydrostatic or pneumatic testing may have leakage that was not detected. These lines are typically short runs of tubing from a drain valve to a drain header inside a panel. These lines are normally isolated and do not see system pressure. A fitting failure would not effect safety operation of the plant. For those lines that potentially contain radioactive fluid, Radiological Instructions RCI 1 & 9, require the presence of Health Physics Technician during sampling or the draining of these panels. It is the responsibility of the Health Physics Technician to monitor the level of radiation as well as to assure the proper disposal of contaminated fluids. If any fittings should leak, steps would be taken to control the leakage and require that repairs be made to avoid any future contamination.
5. The same justification was used at SQN and for BFN (Unit 2). CAPs were approved.